



**BEFORE THE PUBLIC SERVICE COMMISSION OF UTAH**

	)	
IN THE MATTER OF THE	)	Docket No. 03-2035-02
APPLICATION OF PACIFICORP	)	
FOR APPROVAL OF ITS	)	DIRECT TESTIMONY
PROPOSED ELECTRIC RATE	)	OF SAMUEL C. HADAWAY
SCHEDULES & ELECTRIC	)	
SERVICE REGULATIONS	)	
	)	

**MAY 2003**

1    **I. Introduction and Summary of Recommendations**

2    **Q.     Please state your name, occupation, and business address.**

3    A.     My name is Samuel C. Hadaway. I am a Principal in FINANCO, Inc., Financial  
4           Analysis Consultants, 3520 Executive Center Drive, Austin, Texas 78731.

5    **Q.     On whose behalf are you testifying?**

6    A.     I am testifying on behalf of PacifiCorp (the Company).

7    **Q.     Please state your educational background and describe your professional  
8           training and experience.**

9    A.     I have an economics degree from Southern Methodist University and MBA and  
10          Ph.D. degrees in finance from the University of Texas at Austin (UT Austin). I  
11          have served as an adjunct professor in the Graduate School of Business at UT  
12          Austin. I have taught economics and finance courses, and I have conducted  
13          research and directed graduate students writing in these areas. I was previously  
14          Director of the Economic Research Division at the Public Utility Commission of  
15          Texas, where I supervised the Commission's finance, economics, and accounting  
16          staff and served as the Commission's chief financial witness in electric and  
17          telephone rate cases. I have taught courses in various utility conferences on cost  
18          of capital, capital structure, utility financial condition, and cost allocation and rate  
19          design issues. I have made presentations before the New York Society of Security  
20          Analysts, the National Rate of Return Analysts Forum, and various other  
21          professional and legislative groups. I have served as a vice president and on the  
22          board of directors of the Financial Management Association.

1           A list of my publications and testimony I have given before various  
2 regulatory bodies and in state and federal courts is contained in my resume, which  
3 is included as Exhibit UP&L \_\_\_\_ (SCH-1).

4 **Q. Please state the purpose of your testimony.**

5 A. The purpose of my testimony is to estimate PacifiCorp's market required rate of  
6 return on equity (ROE) and to present the Company's requested capital structure  
7 and overall rate of return.

8 **Q. Please outline the testimony you will present.**

9 A. My testimony is divided into five sections. Following this introduction, in Section  
10 II, I present the Company's requested capital structure and overall rate of return.  
11 In Section III, I review various methods for estimating the cost of equity,  
12 including comparable earnings methods, risk premium methods, and discounted  
13 cash flow (DCF) methods. In Section IV, I review general capital market costs  
14 and conditions and discuss recent developments in the electric utility industry that  
15 may affect the cost of capital. In Section V, I discuss the details of my cost of  
16 equity studies and provide a summary table of my ROE results.

17 **Q. Please describe your cost of equity studies and state your ROE**  
18 **recommendation.**

19 A. My ROE estimate is based principally upon the DCF model, with risk premium  
20 analysis offered as a check of reasonableness for the DCF results. I apply three  
21 versions of the DCF model: the traditional Constant Growth model, the Market  
22 Price or terminal value model; and the Two-Stage Growth model. Over the past  
23 decade, fluctuating earnings and dividend cuts have caused most economists to

1 apply alternative versions of the DCF model. As I will explain in more detail in  
2 Section V, recent turbulence in the electric industry also has made it more difficult  
3 to estimate DCF model growth rates. To respond to these issues, I review the  
4 strengths and weakness of the various models, and I offer several alternatives for  
5 interpreting their results.

6 I apply the DCF model to a comparable group of electric utilities.  
7 PacifiCorp cannot be analyzed directly, because PacifiCorp is a wholly-owned  
8 subsidiary of ScottishPower and, therefore, its common stock is not publicly  
9 traded. I restrict my comparable group to lower risk utilities that are rated single-  
10 A or higher by either Moody's or Standard & Poor's (S&P) and that obtain at least  
11 70 percent of their total revenues from domestic utility sales. The companies  
12 must also have earnings growth rates published by Zacks, a widely followed  
13 source of professional earnings estimates, and complete and consistent data (no  
14 recent dividend cuts or inconsistent data due to mergers, etc.) from the *Value Line*  
15 *Investment Service*, also a widely followed source for investment information.  
16 The comparable group approach provides a reasonable estimate of ROE for  
17 typical lower-risk utility operations across the U.S. My risk premium analysis is  
18 based on Moody's recent single-A public utility bond yields. For comparison,  
19 PacifiCorp's debt is rated single-A by both of the major rating agencies (A3 by  
20 Moody's and A by S&P). The data sources and the details of my return on equity  
21 studies are contained in my Exhibits UP&L\_\_\_\_(SCH-2) through UP&L\_\_\_\_(SCH-  
22 7).

My comparable company DCF analysis indicates a reasonable ROE range of 11.0 to 12.0 percent. My risk premium analysis indicates an ROE of 11.1 percent. Based on these estimates and my review of the current market, industry, and Company-specific factors, I recommend a range of 11.0 to 12.0 percent, with a point estimate of 11.5 percent.

## II. Capital Structure and Overall Rate of Return

**Q. Please summarize the Company's requested capital structure and overall rate of return.**

A. The following table identifies the requested capital structure components and the resulting overall rate of return.

<u>Capital Components</u>	<u>Ratio</u>	<u>Cost</u>	<u>Weighted Cost</u>
Debt	48.21%	6.51%	3.14%
Preferred Stock	6.65%	5.80%	0.39%
Common Equity	<u>45.14%</u>	11.50%	<u>5.19%</u>
TOTAL	100.00%		8.72%

**Q. What is the basis for the Company's requested capital structure and overall rate of return?**

A. The requested capital structure is the actual capital structure of the electric utility at March 31, 2003. The cost rates for debt and preferred stock are those provided in the testimony of Company Treasurer, Mr. Bruce N. Williams. The cost of equity is based on my recommended 11.5 percent ROE.

PacifiCorp's equity ratio for 2003, relative to 2001, was improved by the elimination of all dividends from PacifiCorp to Scottish Power after March 18, 2002, and by Scottish Power's infusion of \$150 million of new equity into PacifiCorp on December 19, 2002. Scottish Power has also reduced its dividend

1 to shareholders from about \$1.80 per U.S. share to about \$1.20 per U.S. share.  
2 These actions significantly supported PacifiCorp's financial condition by  
3 offsetting the effects of losses on excess purchased power costs, which likely  
4 prevented further downgrades of the Company's debt.

### 5 **III. Estimating the Cost of Equity Capital**

6 **Q. What is the purpose of this section of your testimony?**

7 A. The purpose of this section is to present a general definition of the cost of equity  
8 and to compare the strengths and weaknesses of several of the most widely-used  
9 methods for estimating the cost of equity. The various models provide a concrete  
10 link to actual capital market data and assist with defining the various relationships  
11 that underlie the ROE estimation process.

#### 12 **Definition of Cost of Equity Capital**

13 **Q. Please define the term "Cost of Equity Capital" and provide an overview of**  
14 **the cost estimation process.**

15 A. The cost of equity capital is the profit or rate of return that equity investors expect  
16 to receive. In concept it is no different than the cost of debt or the cost of  
17 preferred stock. The cost of equity is the rate of return that common stockholders  
18 expect, just as interest on bonds and dividends on preferred stock are the returns  
19 that investors in those securities expect. Equity investors expect a return on their  
20 capital commensurate with the risks they take and consistent with returns that  
21 might be available from other similar investments. Unlike returns from debt and  
22 preferred stocks, however, the equity return is not directly observable in advance.

1 Therefore, it must be estimated or inferred from capital market data and trading  
2 activity.

3 An example helps to illustrate the cost of equity concept. Assume that an  
4 investor buys a share of common stock for \$20 per share. If the stock's annual  
5 dividend is \$1.10, the expected dividend yield is 5.5 percent ( $\$1.10 / \$20 = 5.5$   
6 percent). If the stock price is also expected to increase to \$21.20 after one year,  
7 this \$1.20 expected gain adds an additional 6.0 percent to the expected total rate  
8 of return ( $\$1.20 / \$20 = 6.0$  percent). Therefore, buying the stock at \$20 per share,  
9 the investor expects a total return of 11.5 percent: 5.5 percent dividend yield, plus  
10 6.0 percent price appreciation. In this example, the total expected rate of return at  
11 11.5 percent is the appropriate measure of the cost of equity capital, because it is  
12 this rate of return that caused the investor to commit the \$20 of equity capital in  
13 the first place. If the stock were riskier, or if expected returns from other  
14 investments were higher, investors would have required a higher rate of return  
15 from the stock, which would have resulted in a lower initial purchase price in  
16 market trading.

17 Each day market rates of return and prices change to reflect new investor  
18 expectations and requirements. For example, when interest rates on bonds and  
19 savings accounts rise, utility stock prices usually fall. This is true, at least in part,  
20 because higher interest rates on these alternative investments make utility stocks  
21 relatively less attractive, which causes utility stock prices to decline in market  
22 trading. This competitive market adjustment process is quick and continuous, so  
23 that market prices generally reflect investor expectations and the relative



1       attractiveness of one investment versus another. In this context, to estimate the  
2       cost of equity one must apply informed judgment about the relative risk of the  
3       company in question and knowledge about the risks and expected rates of return  
4       of other available investments.

5   **Q.   How does the market account for risk differences among the various**  
6   **investments?**

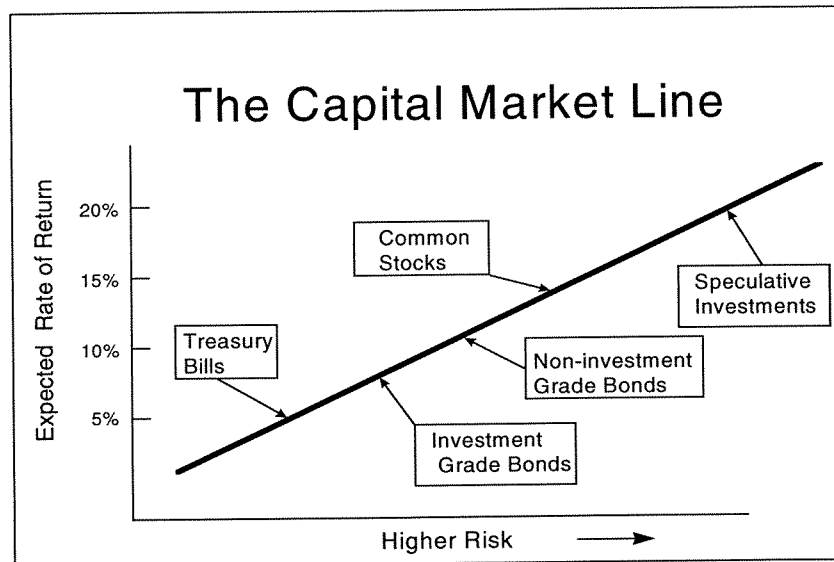
7   A.   Risk-return tradeoffs among capital market investments have been the subject of  
8       extensive financial research. Literally dozens of textbooks and hundreds of  
9       academic articles have addressed the issue. Generally, such research confirms the  
10      common sense conclusion that investors will take additional risks only if they  
11      expect to receive a higher rate of return. Empirical tests consistently show that  
12      low risk securities, such as U.S. Treasury bills, have the lowest returns; that  
13      returns from longer-term Treasury bonds and corporate bonds are higher as risks  
14      increase; and generally, returns from common stocks and other more risky  
15      investments are even higher. These observations provide a sound theoretical  
16      foundation for both the DCF and risk premium methods for estimating the cost of  
17      equity capital. These methods attempt to capture the well-founded risk-return  
18      principle and explicitly measure investors' rate of return requirements.

19   **Q.   Can you illustrate the capital market risk-return principle that you just**  
20   **described?**

21   A.   Yes. The following graph depicts the risk-return relationship that has become  
22       widely known as the Capital Market Line (CML). The CML offers a graphical  
23       representation of the capital market risk-return principle. The graph is not meant

1 to illustrate the actual expected rate of return for any particular investment, but  
2 merely to illustrate in a general way the risk-return relationship.

## Risk-Return Tradeoffs



3  
4 As a continuum, the CML can be viewed as an available opportunity set  
5 for investors. Those investors with low risk tolerance or investment objectives  
6 that mandate a low risk profile should invest in assets depicted in the lower left-  
7 hand portion of the graph. Investments in this area, such as Treasury bills and  
8 short-maturity, high quality corporate commercial paper, offer a high degree of  
9 investor certainty. In nominal terms (before considering the potential effects of  
10 inflation), such assets are virtually risk-free.

11 Investment risks increase as one moves up and to the right along the CML.  
12 A higher degree of uncertainty exists about the level of investment value at any  
13 point in time and about the level of income payments that may be received.  
14 Among these investments, long-term bonds and preferred stocks, which offer

1 priority claims to assets and income payments, are relatively low risk, but they are  
2 not risk-free. The market value of long-term bonds, even those issued by the U.S.  
3 Treasury, often fluctuates widely when government policies or other factors cause  
4 interest rates to change.

5 Further up the CML continuum, common stocks are exposed to even more  
6 risk, depending on the nature of the underlying business and the financial strength  
7 of the issuing corporation. Common stock risks include market-wide factors, such  
8 as general changes in capital costs, as well as industry and company specific  
9 elements that may add further to the volatility of a given company's performance.  
10 As I will illustrate in my risk premium analysis, common stocks typically are  
11 more volatile (have higher risk) than high-quality bond investments, and  
12 therefore, they reside above and to the right of bonds on the CML graph. Other  
13 more speculative investments, such as stock options and commodity futures  
14 contracts, offer even higher risks (and higher potential returns). The CML's  
15 depiction of the risk-return tradeoffs available in the capital markets provides a  
16 useful perspective for estimating investors' required rates of return.

17 **Q. How is the fair rate of return in the regulatory process related to the**  
18 **estimated cost of equity capital?**

19 **A.** The regulatory process is guided by fair rate of return principles established in the  
20 U.S. Supreme Court cases, *Bluefield Waterworks* and *Hope Natural Gas*:

21 A public utility is entitled to such rates as will permit it to earn a  
22 return on the value of the property which it employs for the  
23 convenience of the public equal to that generally being made at the  
24 same time and in the same general part of the country on  
25 investments in other business undertakings which are attended by

1 corresponding risks and uncertainties; but it has no constitutional  
2 right to profits such as are realized or anticipated in highly  
3 profitable enterprises or speculative ventures. *Bluefield*  
4 *Waterworks & Improvement Company v. Public Service*  
5 *Commission of West Virginia*, 262 U.S. 679, 692-693 (1923).

6 \* \* \* \* \*

8 From the investor or company point of view, it is important that  
9 there be enough revenue not only for operating expenses, but also  
10 for the capital costs of the business. These include service on the  
11 debt and dividends on the stock. By that standard the return to the  
12 equity owner should be commensurate with returns on investments  
13 in other enterprises having corresponding risks. That return,  
14 moreover, should be sufficient to assure confidence in the financial  
15 integrity of the enterprise, so as to maintain its credit and to attract  
16 capital. *Federal Power Commission v. Hope Natural Gas Co.*, 320  
17 U.S. 591, 603 (1944).

18 Based on these principles, the fair rate of return should closely parallel  
19 investor opportunity costs as discussed above. If a utility earns its market cost of  
20 equity, neither its stockholders nor its customers should be disadvantaged.

## 21 **Methods for Estimating Cost of Equity Capital**

22 **Q. What specific methods and capital market data are used to evaluate the cost**  
23 **of equity?**

24 A. Techniques for estimating the cost of equity normally fall into three groups:  
25 comparable earnings methods, risk premium methods, and DCF methods. The  
26 first set of estimation techniques, the comparable earnings methods, has evolved  
27 over time. The original comparable earnings methods were based on book  
28 accounting returns. This approach developed ROE estimates by reviewing  
29 accounting returns for unregulated companies thought to have risks similar to  
30 those of the regulated company in question. These methods have generally been  
31 rejected because they assume that the unregulated group is earning its actual cost

1 of capital, and that its equity book value is the same as its market value. In most  
2 situations these assumptions are not valid, and, therefore, accounting-based  
3 methods do not generally provide reliable cost of equity estimates.

4 More recent comparable earnings methods are based on historical stock  
5 market returns rather than book accounting returns. While this approach has some  
6 merit, it too has been criticized because there can be no assurance that historical  
7 returns actually reflect current or future market requirements. Also, in practical  
8 application, earned market returns tend to fluctuate widely from year to year. For  
9 these reasons, a current cost of equity estimate (based on the DCF model or a risk  
10 premium analysis) is usually required.

11 The second set of estimation techniques is grouped under the heading of  
12 risk premium methods. These methods begin with currently observable market  
13 returns, such as yields on government or corporate bonds, and add an increment to  
14 account for the additional equity risk. The Capital Asset Pricing Model (CAPM)  
15 and the Arbitrage Pricing Theory (APT) model are more sophisticated risk  
16 premium approaches. The CAPM and APT methods estimate the cost of equity  
17 directly by combining the “risk-free” government bond rate with explicit risk  
18 measures to determine the risk premium required by the market. Although these  
19 methods are widely used in academic cost of capital research, their additional data  
20 requirements and their potentially questionable underlying assumptions have  
21 limited their use in many regulatory jurisdictions. Generally, the risk premium  
22 methods provide a useful parallel approach with the DCF model and assure  
23 consistency with other capital market data in the cost of equity estimation process.

1           The third set of estimation techniques, based on the DCF model, is the  
2 most widely used regulatory cost of equity estimation method. Like the risk  
3 premium approach, the DCF model has a sound basis in theory, and many argue  
4 that it has the additional advantage of simplicity. I will describe the DCF model  
5 in detail below, but in essence its estimate of ROE is simply the sum of the  
6 expected dividend yield and the expected long-term dividend (or price) growth  
7 rate. While dividend yields are easy to obtain, estimating long-term growth is  
8 more difficult. Because the constant growth DCF model also requires very long-  
9 term growth estimates (technically to infinity), some argue that its application is  
10 too speculative to provide reliable results, resulting in the preference for the  
11 multistage growth DCF analysis.

12 **Q. Of the three estimation methods, which do you believe provides the most**  
13 **reliable results?**

14 A. From my experience, a combination of discounted cash flow and risk premium  
15 methods provides the most reliable approach. While the caveat about estimating  
16 long-term growth must be observed, the DCF model's other inputs are readily  
17 obtainable, and the model's results typically are consistent with capital market  
18 behavior. The risk premium methods provide a good parallel approach to the  
19 DCF model and further ensure that current market conditions are accurately  
20 reflected in the cost of equity estimate.

21 **Q. Please explain the DCF model.**

22 A. The DCF model is predicated on the concept that stock prices represent the  
23 present value or discounted value of all future dividends that investors expect to

1 receive. In the most general form, the DCF model is expressed in the following  
2 formula:

$$3 \quad P_0 = D_1/(1+k) + D_2/(1+k)^2 + \dots + D_\infty/(1+k)^\infty \quad (1)$$

4 where  $P_0$  is today's stock price;  $D_1$ ,  $D_2$ , etc. are all future dividends and  $k$  is the  
5 discount rate, or the investor's required rate of return on equity. Equation (1) is a  
6 routine present value calculation based on the assumption that the stock's price is  
7 the present value of all dividends expected to be paid in the future.

8 Under the additional assumption that dividends are expected to grow at a  
9 constant rate "g" and that  $k$  is strictly greater than  $g$ , equation (1) can be solved for  
10  $k$  and rearranged into the simple form:

$$11 \quad k = D_1/P_0 + g \quad (2)$$

12 Equation (2) is the familiar constant growth DCF model for cost of equity  
13 estimation, where  $D_1/P_0$  is the expected dividend yield and  $g$  is the long-term  
14 expected dividend growth rate.

15 Under circumstances when growth rates are expected to fluctuate or when  
16 future growth rates are highly uncertain, the constant growth model may not give  
17 reliable results. Although the DCF model itself is still valid [equation (1) is  
18 mathematically correct], under such circumstances the simplified form of the  
19 model must be modified to capture market expectations accurately.

20 Restructuring in many jurisdictions and other events in the electric utility  
21 industry, as discussed in Section IV, have challenged the constant growth  
22 assumption of the traditional DCF model. Since the mid-1980s, dividend growth  
23 expectations for many electric utilities have fluctuated widely. In fact, about half

of the electric utilities in the U.S. have reduced or eliminated their common dividends during the past several years. Some of these companies have reestablished dividends, producing exceptionally high growth rates. Under these circumstances, long-term growth rate estimates are sometimes highly uncertain, and estimating a reliable “constant” growth rate for some companies is difficult. Under these conditions, singular reliance on the constant growth DCF model may not be appropriate.

**Q. How can the DCF model be applied when the constant growth assumption is violated?**

A. When growth expectations are uncertain, the more general version of the model represented in equation (1) should be solved explicitly over a finite “transition” period while uncertainty prevails. The constant growth version of the model can then be applied after the transition period, under the assumption that more stable conditions will prevail in the future. There are two alternatives for dealing with the non-constant growth transition period.

Under the “Market Price” non-constant growth approach, equation (1) is written in a slightly different form:

$$P_0 = D_1/(1+k) + D_2/(1+k)^2 + \dots + P_T/(1+k)^T \quad (3)$$

where the variables are the same as in equation (1) except that  $P_T$  is the estimated stock price at the end of the transition period  $T$ . Under the assumption that normal growth resumes after the transition period, the price  $P_T$  is then expected to be based on constant growth assumptions. With the terminal price approach, the estimated cost of equity,  $k$ , is just the rate of return that investors would expect to



1 earn if they bought the stock at today's market price, held it and received  
2 dividends through the transition period (until period T), and then sold it for price  
3  $P_T$ . In this approach, the analyst's task is to estimate the rate of return that  
4 investors expect to receive given the current level of market prices they are  
5 willing to pay.

6 Under the "Multistage" non-constant growth approach, equation (1) is  
7 simply expanded to incorporate two or more growth rate periods, with the  
8 assumption that a permanent constant growth rate can be estimated for some point  
9 in the future:

$$10 \quad P_0 = D_0(1+g_1)/(1+k) + \dots + D_0(1+g_2)^n/(1+k)^n +$$
$$11 \quad \dots + D_0(1+g_T)^{(T+1)}/(k-g_T) \quad (4)$$

12 where the variables are the same as in equation (1), but  $g_1$  represents the growth  
13 rate for the first period,  $g_2$  for a second period, and  $g_T$  for the period from year T  
14 (the end of the transition period) to infinity. The first two growth rates are simply  
15 estimates for fluctuating growth over "n" years (typically five or ten years) and  $g_T$   
16 is a constant growth rate assumed to prevail forever after year T. The difficult  
17 task for analysts in the multistage approach is determining the various growth  
18 rates for each period.

19 Although less convenient for exposition purposes, the non-constant growth  
20 models are based on the same valid capital market assumptions as the constant  
21 growth version. The non-constant growth approach simply requires more explicit  
22 data inputs and more work to solve for the discount rate,  $k$ . Fortunately, the  
23 required data are available from investment and economic forecasting services,

1 and computer algorithms can easily produce the required solutions. Both constant  
2 and non-constant growth DCF analyses are presented in the following section.

3 **Q. Please explain the risk premium methodology.**

4 A. Risk premium methods are based on the assumption that equity securities are  
5 riskier than debt and, therefore, that equity investors require a higher rate of  
6 return. This basic premise is well supported by legal and economic distinctions  
7 between debt and equity securities, and it is widely accepted as a fundamental  
8 capital market principle. For example, debt holders' claims to the earnings and  
9 assets of the borrower have priority over all claims of equity investors. The  
10 contractual interest on mortgage debt must be paid in full before any dividends  
11 can be paid to shareholders, and secured mortgage claims must be fully satisfied  
12 before any assets can be distributed to shareholders in bankruptcy. Also, the  
13 guaranteed, fixed-income nature of interest payments makes year-to-year returns  
14 from bonds typically more stable than capital gains and dividend payments on  
15 stocks. All these factors demonstrate the more risky position of stockholders and  
16 support the equity risk premium concept.

17 **Q. Are risk premium estimates of the cost of equity consistent with other**  
18 **current capital market costs?**

19 A. Yes. The risk premium approach is especially useful because it is founded on  
20 current market interest rates, which are directly observable. This feature assures  
21 that risk premium estimates of the cost of equity begin with a sound basis, which  
22 is tied directly to current capital market costs.

1   **Q.   Is there similar consensus about how risk premium data should be**  
2   **employed?**

3   A.   No. In regulatory practice, there is often considerable debate about how risk  
4   premium data should be interpreted and used. Since the analyst's basic task is to  
5   gauge investors' required returns on long-term investments, some argue that the  
6   estimated equity spread should be based on the longest possible time period.  
7   Others argue that market relationships between debt and equity from several  
8   decades ago are irrelevant and that only recent debt-equity observations should be  
9   given any weight in estimating investor requirements. There is no consensus on  
10   this issue. Since analysts cannot observe or measure investors' expectations  
11   directly, it is not possible to know exactly how such expectations are formed or,  
12   therefore, to know exactly what time period is most appropriate in a risk premium  
13   analysis.

14           The important point is to answer the following question: "What rate of  
15   return should equity investors reasonably expect relative to returns that are  
16   currently available from long-term bonds?" The risk premium studies and  
17   analyses I discuss in Section IV of my testimony address this question. My risk  
18   premium recommendation is based on an intermediate position that avoids some  
19   of the problems and concerns that have been expressed about both very long and  
20   very short periods of analysis with the risk premium model.

21   **Q.   Please summarize your discussion of cost of equity estimation techniques.**

22   A.   Because actual investor requirements are not directly observable, several methods  
23   have been developed to assist in the estimation process. The comparable earnings

1 method is the oldest but perhaps least reliable. Its use of accounting rates of  
2 return, or even historical market returns, may or may not reflect current investor  
3 requirements. Differences in accounting methods among companies and issues of  
4 comparability also detract from this approach.

5 The DCF and risk premium methods have become the most widely  
6 accepted in regulatory practice. A combination of the DCF model and a review of  
7 risk premium data provides the most reliable cost of equity estimate. While the  
8 DCF model does require judgment about future growth rates, the dividend yield is  
9 straightforward, and the model's results are generally consistent with actual  
10 capital market behavior. For these reasons, I will rely on a combination of the  
11 DCF model and a risk premium analysis in the cost of equity studies that follow in  
12 Section V of this testimony.

#### 13 **IV. Fundamental Factors that Affect the Cost of Equity Capital**

14 **Q. What is the purpose of this section of your testimony?**

15 A. The purpose of this section is to review recent capital market costs and conditions  
16 as well as industry- and Company-specific factors that should be reflected in the  
17 cost of equity capital in this case.

18 **Q. What has been the recent experience in the U.S. capital markets?**

19 A. Exhibit UP&L\_\_\_\_(SCH-2) provides a review of annual interest rates and rates of  
20 inflation that have prevailed in the U.S. economy over the past ten years. During  
21 that period, inflation and capital market costs have been relatively stable and  
22 lower than prevailed in the previous decade. Inflation in 2002, as measured by the  
23 Consumer Price Index, was 1.5 percent, a level not seen consistently since the

1 early 1960s. The uneven and faltering economic recovery has constrained  
2 consumer price increases and resulted in corporate interest rates that approximate  
3 the low rate levels that occurred in 1998 and early 1999. Although rising energy  
4 prices and eventual economic growth are expected to firm up consumer prices and  
5 interest rates in 2003, to date these effects have been minor. Most estimates for  
6 2003 are for improved economic growth, but uncertainty continues about when  
7 and how robust the recovery will be.

8 In addition to relatively stable economic data, "flight to safety" investment  
9 strategies and recent U.S. Treasury debt management policies have altered  
10 important capital market relationships. Treasury operations have focused on  
11 short-term liquidity, and generally shorter maturities for Treasury debt. Also, both  
12 within and outside the U.S., increasing uncertainty and, at times, extreme capital  
13 market volatility have further changed traditional relationships. Since the late  
14 1990s, Asian, Russian, and South American financial crises have caused literally  
15 billions of dollars to flow out of more risky international investments and into  
16 U.S. Treasury bonds. Similarly, the drop in U.S. and worldwide equity price  
17 contributed further to the demand for low-risk Treasury securities. These unusual  
18 supply and demand conditions, along with the Treasury's own debt management  
19 policies, have caused significant market anomalies, with the Treasury rates for all  
20 maturities at historically low levels.

21 The effect of these relationships is prominent in the current market interest  
22 rate data. For example, prior to the international financial crisis of 1998, for the  
23 15 years ended in 1997, rates on single-A industrial bonds averaged 116 basis

1 points (1.16 percent) above long-term Treasury bonds. By October 1998, in the  
2 midst of the Asian and Russian monetary difficulties, the U.S. industrial single-A  
3 spread widened to 172 basis points, and the single-A public utility spread widened  
4 even more to 195 basis points. In 2003, single-A utility yield spreads remained  
5 historically large, with the March 2003 spread at 193 basis points. This  
6 relationship reflects on-going concerns about increasing capital market risks and  
7 vividly illustrates the increasing corporate cost of capital relative to U.S. Treasury  
8 bond interest rates. Exhibit UP&L\_\_\_\_(SCH-3) provides a summary of Moody's  
9 Average Utility and Single-A Utility Bond Yields. For the most recent three  
10 months ended March 2003, the Moody's Average Utility Rate was 6.97 percent,  
11 and the Single-A Utility Rate was 6.94 percent.

12 **Q. How have utility stocks performed during the past year?**

13 A. During the past year, utility stock prices have fluctuated widely. From a level of  
14 310.18 in April 2002, the current Dow Jones Utility Average at 223.06 (April 24,  
15 2003) is about 28 percent below the year-ago level.

16 **Q. What is the current fundamental position of the electric utility industry?**

17 A. The electric utility industry continues to be troubled by transition, restructuring,  
18 and power cost issues of the past several years. Although the pace of deregulation  
19 has slowed, the general trend toward a more competitive environment and the  
20 resulting shifts within the industry continue to cause uncertainty. The precipitous  
21 decline in utility stock prices is an indication of these factors. In its recent  
22 Industry Summary, *Value Line* offered the following:

1 Last year's fragile economy was a set back for many utilities.  
2 Studies in the late 1990s indicated that energy demand was likely  
3 to grow at a faster pace than plants were being constructed. This  
4 sparked a building boom in 2000 and 2001, but energy demand  
5 slackened along with business activity. Retail electricity sales,  
6 which, industrywide, were expected to rise by about 2% last year,  
7 probably increased by only half that amount. The combination of  
8 available new generation and a falloff in the wholesale power  
9 market created an energy surplus that is likely to persist for another  
10 few years. . . . The economic situation for utilities isn't likely to  
11 improve in 2003. Standard & Poor's recently stated that in the first  
12 nine months of 2002 it made 135 credit downgrades of utility  
13 holding company and their subsidiaries and that prospects continue  
14 to deteriorate. In another sign of trouble, Fitch Ratings advises that  
15 nearly one-third of its electric utility ratings worldwide has a  
16 negative credit rating outlook. (*Value Line Investment Survey*,  
17 April 4, 2003, p. 695.)

18 **Q. Are there important issues in the State of Utah that should be considered in**  
19 **setting PacifiCorp's allowed rate of return?**

20 A. Yes, in recent years Utah's economy has grown markedly faster than the national  
21 average. Even though economic growth has recently slowed, the Utah economy  
22 continues to be stronger than in many other states. Growth in Utah continues to  
23 require new investment in power plants and power lines. On the heels of the  
24 debilitating energy crisis of 2000-2001, PacifiCorp now needs internally generated  
25 cash and good credit quality to finance those power stations and power lines.  
26 PacifiCorp needs the opportunity to earn a rate of return that will enable it to  
27 maintain its credit quality and generate cash flows to finance the energy  
28 infrastructure the state requires.

1   **Q.   Is PacifiCorp also affected by the general uncertainties you described**  
2       **previously for the rest of the electric utility industry?**

3   A.   Yes. Although deregulation has not occurred in PacifiCorp's principal regulatory  
4       jurisdictions, the Company faces many of the same issues that have affected  
5       utilities all around the country. The restructuring of power markets and the  
6       resulting uncertainties about power costs have affected all utilities. These factors  
7       for PacifiCorp led to a downgrade of its debt ratings in 2001, and have caused  
8       both major rating agencies to project a negative outlook for the Company. The  
9       Company is continuing its efforts to recover from the 2000-2001 energy crisis, but  
10      the share price of parent company ScottishPower is decidedly down over the past  
11      three years. As discussed previously, PacifiCorp had not paid dividends to its  
12      parent since March 2002, and ScottishPower has reduced its dividends to  
13      shareholders by one-third. ScottishPower also provided an equity infusion to  
14      PacifiCorp of \$150 million in December 2002. Amid this news PacifiCorp's need  
15      for new capital for utility construction remains large. All these factors should be  
16      considered in evaluating PacifiCorp's required rate of return.

17   **Q.   How do investor concerns and uncertainty affect the cost of equity capital?**

18   A.   As I discussed in Section III, equity investors respond to changing assessments of  
19      risk and financial prospects by changing the price they are willing to pay for a  
20      given security. When risk perceptions increase or financial prospects decline,  
21      investors reduce the previously existing market price for a company's securities  
22      and market supply and demand work together to determine a new lower price.  
23      The lower market price typically translates to a higher cost of capital through a



1 higher dividend yield requirement as well as the potential for increased capital  
2 gains if prospects improve. In addition to potential market losses for prior  
3 shareholders, the higher cost of capital is transmitted directly to the company by  
4 the need to issue more shares to raise any given amount of capital for future  
5 investment.

6 **V. Cost of Equity Capital for PacifiCorp**

7 **Q. What is the purpose of this section of your testimony?**

8 A. The purpose of this section is to describe my quantitative cost of capital studies  
9 and to discuss the details and results of my analyses.

10 **Q. How are your studies organized?**

11 A. First, I apply three versions of the DCF model to a comparable sample of single-A  
12 rated electric utilities. The comparable group consists of all electric utility  
13 companies rated single-A or higher by either Moody's or S&P, for which at least  
14 70 percent of total revenues come from domestic utility sales, and for which  
15 complete and reliable data are available from Zacks and *Value Line* (no recent  
16 dividend cuts, no extraordinary earnings or other merger effects, etc.) The results  
17 of my DCF analyses are summarized in Exhibit UP&L\_\_\_\_(SCH-5), page 1 of 5.  
18 The DCF models produce a range of 10.9 to 12.1 percent. I ultimately narrow this  
19 range to 11.0 to 12.0 percent. I believe this 100 basis point (1.0 percent) range  
20 provides a fair estimate of ROE for relatively low risk, single-A rated electric  
21 utilities.

22 The three versions of the DCF model differ based on the methods used to  
23 estimate growth. In the most conservative Two-Stage Growth Model, I use *Value*

1        *Line's* projected dividends for stage 1. The estimated growth rate for these  
2        dividends is very low (2.83 percent), which is approximately equal to the recent  
3        average low inflation rate. For stage 2 in the Two-Stage Growth Model, I use the  
4        20-year (1982-2001) nominal growth rate (6.0 percent) for Gross Domestic  
5        Product (GDP).<sup>1</sup> Particularly during periods of industry turbulence and  
6        historically low inflation, longer-term GDP growth is a better measure of long-  
7        term growth expectations than either near-term analysts' estimates or other  
8        methods based on short-term data. The GDP data for various periods is provided  
9        in Exhibit UP&L\_\_\_\_(SCH-6). The Two-Stage Growth model produces an ROE  
10       range of 10.9 to 11.0 percent (Exhibit UP&L\_\_\_\_(SCH-5), page 4), which forms  
11       the lower end of my estimated ROE range.

12                The upper end of my range comes from the non-constant growth, Market  
13       Price DCF Model. In that model, ROE is again estimated from the low-growth  
14       dividends projected by *Value Line*, but it is assumed that shares will be sold for an  
15       estimated "Market Price" after four years. In this model, the "Market Price" is  
16       estimated from *Value Line's* projected 2007 earnings per share (EPS) and an  
17       estimated price-to-earnings (P/E) ratio. I have estimated P/E by averaging each  
18       company's current P/E with *Value Line's* projected P/Es.<sup>2</sup> The Market Price

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<sup>1</sup> GDP is the broadest measure of growth in the U.S. economy. Its growth rate is recommended as an estimate of long-term growth in the DCF model. See, for example, Brigham and Gapenski, *Financial Management* (ninth edition), p. 335.

<sup>2</sup> This approach is a compromise between using the current market-determined P/E, which currently would produce a lower ROE, or using *Value Line's* projected P/E's, which would produce a higher ROE.

1 DCF Model produces an ROE of 12.1 percent (Exhibit UP&L\_\_\_\_(SCH-5), page  
2 3).

3 I also present the results from the traditional Constant Growth Model. As  
4 discussed previously, in recent years most economists have expressed concerns  
5 about conditions and events in the electric utility that have changed the traditional  
6 DCF model's constant growth rate assumption. In my application of the Constant  
7 Growth Model, I have attempted to deal with these issues by averaging four  
8 different sources of estimated growth. I include analysts' five-year growth  
9 estimates from Zacks, Value Line's growth estimates, a sustainable growth "b  
10 time r" estimate, and the 20-year growth rate in GDP. The Constant Growth DCF  
11 Model produces an ROE range of 11.1 to 11.2 percent. (Exhibit UP&L\_\_\_\_(SCH-  
12 5), page 2)

13 In the second part of my analysis, I develop cost of equity estimates based  
14 on the risk premium approach. I use these risk premium results as a test of  
15 reasonableness for my DCF analysis. My risk premium analysis is presented in  
16 Exhibit UP&L\_\_\_\_(SCH-7). That analysis, which is based on allowed electric  
17 ROEs relative to contemporaneous utility debt costs for the period 1980-2002,  
18 indicates a cost of equity of 11.1 percent. Given current market and utility  
19 industry conditions, I believe the risk premium approach adds perspective for  
20 judging current investor requirements. Based on the results of my DCF and risk  
21 premium studies and my review of current market and industry conditions, I  
22 estimate the current utility cost of equity to be in the range of 11.0 to 12.0 percent,  
23 with a midpoint recommendation of 11.5 percent.

1    **DCF Results**

2    **Q.    Why are you providing results from three different versions of the DCF**  
3        **model?**

4    A.    In recent years, most rate of return analysts have begun to offer alternative  
5        versions of the DCF model. This trend developed because transition toward  
6        competition and restructuring fundamentally changed the investment outlook for  
7        utility shares.

8    **Q.    What are the strengths and weaknesses of the alternative models?**

9    A.    The Market Price model is the least subjective of the DCF methods, because it  
10        does not rely on the analyst's judgment about growth rates. The model uses *Value*  
11        *Line's* currently low growth, year-by-year projected dividends in stage one and  
12        *Value Line's* projected earnings per share and price-to-earnings ratios to estimate  
13        future price in stage two. The Market Price model, however, is the most volatile  
14        model, because its results depend on expected future share prices. In most cases,  
15        the wider range of projected share prices, causes a wider range of ROE estimates  
16        from the model. For this reason, I believe it is especially important to have a  
17        relatively large sample group so that any one observation does not have an undue  
18        influence on the average results.

19                The Two-Stage Growth model uses *Value Line's* low near-term dividends  
20        for stage one, but requires a constant long-term growth estimate for stage two. In  
21        this framework, it is especially important for stage two growth to reflect longer-  
22        term prospects and not to be unduly influenced by the industry's recent  
23        restructuring and low dividend growth policies. Because this model relies heavily

1 on low near-term dividend growth, it generally produces very conservative ROE  
2 estimates.

3 **Q. What stock prices are used in your DCF analysis?**

4 A. My analysis is based on average stock prices from the most recent three months  
5 for each company (February-April 2003). Although technically either average or  
6 spot stock prices can be used in a DCF analysis, a reasonably current price  
7 consistent with present market conditions and the other data employed in the  
8 analysis is most appropriate. Since the cost of equity is a current and forward-  
9 looking concept, the important issue is that the price should be representative of  
10 current market conditions and not unduly influenced by unusual or special  
11 circumstances.

12 To ensure that my DCF analyses are not skewed by unrepresentative initial  
13 stock prices, I calculate, in my Exhibit UP&L\_\_\_\_(SCH-4), the average of high and  
14 low prices for each of the three months ending April 2003 for each company in  
15 my comparable group. I then compare the three-month average price for each  
16 company to *Value Line's* single-month prices. As shown in column 6 of my  
17 Exhibit UP&L\_\_\_\_(SCH-4), the three-month average price used in my analysis is  
18 \$0.40 per company higher than *Value Line's* single-month prices. I have  
19 consistently used the three-month averaging approach, which adds stability to the  
20 ROE estimation process and generally does not have a material impact on the  
21 DCF results.

1   **Q.    How are the growth rates determined in your DCF analysis?**

2   A.    As noted above, in the Two-Stage Growth and Market Models, stage 1 growth is  
3       based on *Value Line's* currently low projected dividend growth (about 2.83  
4       percent per year) . For stage 2 in the Two-Stage Growth model, I use the GDP  
5       growth rate.

6   **Q.    Why are the GDP growth rates appropriate for estimating long-term**  
7       **growth?**

8   A.    The 20-year historical GDP growth rate is a reasonable estimate of long-term  
9       expectations because the GDP measures the overall growth in the U.S. economy.  
10       Utilities are basic necessity providers, and, as such, their growth rates should be  
11       similar to the overall growth rate in the economy. I have compiled data from the  
12       Federal Reserve Bank of St. Louis, which show U.S. economic growth rates and  
13       rates of inflation for several historical periods from the past 40 years. These data  
14       are summarized in Exhibit UP&L\_\_\_\_(SCH-6). For the most recent 10-year period  
15       (1992-2001), the average nominal growth rate in U.S. Gross Domestic Product  
16       (GDP) was 5.3 percent. The average annual GDP growth rate over the past 20  
17       years (1982-2001) was 6.0 percent; for the past 30 years (1972-2001) it was 7.6  
18       percent; and for the past 40 years (1961-2001) it was 7.5 percent. These data are  
19       shown at the bottom of column 2 in Exhibit UP&L\_\_\_\_(SCH-6).

20               I have also compiled similar averages for rates of inflation over the past 40  
21       years. The averages of these data are shown at the bottom of columns 4 and 6 in  
22       Exhibit UP&L\_\_\_\_(SCH-6). As measured by the more conservative GDP Price  
23       Deflator (GDPPD, column 4), average inflation for the past 10 years (1992-2001)

1 was 2.0 percent per year. As measured by the Consumer Price Index (CPI,  
2 column 6) , average inflation for the past 10 years was 2.5 percent. For the past  
3 20 years the GDPPD and CPI average inflation rates were 2.7 percent and 3.2  
4 percent, respectively; for the past 30 years, they were 4.3 percent and 5.0 percent;  
5 and for the past 40 years, they were 4.1 percent to 4.6 percent.

6 **Q. How do these data provide perspective for the long-term expected growth**  
7 **rates required in the DCF model?**

8 A. Because these data are widely published and widely used in almost all forms of  
9 economic and investment analysis, they form the core indicators of economic  
10 growth potential. At the first level, investors expect long-term growth rates that  
11 exceed inflation rates. Otherwise, in terms of purchasing power, investors would  
12 be holding stocks with the expectation of negative real long-term growth. Such  
13 investor behavior is inconsistent with financial market theory, and entirely  
14 contrary to actual investors' experience in the capital markets. Equity investors  
15 expect, and consistently have received, long-term growth rates well above rates of  
16 inflation.

17 At a second level, utility investors should expect long-term growth rates  
18 similar to overall economic growth. While some industries may be in economic  
19 decline and have low long-term growth expectations, other industries have  
20 technological reasons which cause their long-term growth expectations to exceed  
21 overall economic growth. Given the fundamental nature of basic utility services,  
22 however, it is unlikely that long-run growth expectations can either far exceed or  
23 fall much below overall economic growth. For this reason, expected long-term

1 growth rates for utility investors must approximate expected long-term growth in  
2 the overall economy.

3 In this context the average 5.67 percent growth rate used in my Constant  
4 Growth DCF Model analysis appears to be conservative. It is below the 6.0  
5 percent GDP growth rate for the past 20 years, and it is well below the 7.5 to 7.6  
6 percent GDP growth rates for the past 30 to 40 years. Although the effects of  
7 industry restructuring, low inflation rates, and slow economic growth may indicate  
8 low near-term utility growth rates, such rates are not consistent with the long-term  
9 requirements of the DCF model. More important, they should not be used to  
10 artificially reduce estimates of investor ROE requirements.

#### 11 **Risk Premium Analysis**

12 **Q. What are the results of your risk premium studies?**

13 A. The results of my risk premium studies are shown in my Exhibit UP&L\_\_\_(SCH-  
14 7). My analysis compares average ROEs allowed for electric utilities each year by  
15 the various state regulatory commissions to contemporaneous utility debt costs for  
16 the period 1980-2002. My analysis indicates a risk premium of 4.12 percent.  
17 When this risk premium is added to the recent, single-A utility debt cost of 6.94  
18 percent, the resulting ROE is 11.1 percent ( $6.94\% + 4.12\% = 11.06\%$ ).

19 **Q. How are your risk premium studies structured?**

20 A. My risk premium studies are divided into two parts. First, I compare electric  
21 utility authorized ROEs for the period 1980-2002 to contemporaneous long-term  
22 utility debt rates. The differences between the average authorized ROEs and the  
23 average cost of utility debt for the year is the indicated equity risk premium. A



1 review of the annual risk premium data in Exhibit UP&L\_\_\_\_(SCH-7) shows that  
2 risk premiums are small when interest rates are high and larger when interest rates  
3 are low. For example, in the early 1980s when utility interest rates exceeded  
4 fifteen percent, allowed equity risk premiums were generally less than two  
5 percent. In more recent years, with much lower interest rates, regulatory allowed  
6 risk premiums have been in the range of three to four percent.

7           The inverse relationship between risk premiums and interest rate levels is  
8 well documented in numerous, well-respected academic studies. (For example,  
9 see Robert S. Harris and Felicia C. Marston, "Estimating Shareholder Risk Premia  
10 Using Analysts' Growth Forecasts," Financial Management, Summer 1992.)  
11 These studies typically use regression analysis or other statistical methods to  
12 predict or measure the risk premium relationship under varying interest rate  
13 conditions. On page 2 of Exhibit UP&L\_\_\_\_(SCH-7), I present a regression  
14 analysis of the allowed annual equity risk premiums relative to interest rate levels.  
15 The negative and statistically significant regression coefficient from that analysis  
16 confirms the inverse relationship between risk premiums and interest rates. The  
17 analysis shows that risk premiums expand and contract in the opposite direction of  
18 interest rate changes. This means that when interest rates rise by one percentage  
19 point, the cost of equity increases by a smaller amount. Similarly, when interest  
20 rates decline by one percentage point, the cost of equity declines by less than one  
21 percentage point. I use the negative interest rate change coefficient in conjunction  
22 with current interest rates to establish the appropriate current equity risk premium.

1 These calculations are shown in the lower portion of page 1 of Exhibit  
2 UP&L\_\_\_\_(SCH-7).

3 **Q. How do the results of your risk premium studies compare to levels found in**  
4 **other published risk premium studies?**

5 A. My risk premium studies indicate a lower risk premium than found in some other  
6 published studies. For example, the most widely followed risk premium studies,  
7 which are published annually by Ibbotson Associates, for the period 1926-2002,  
8 indicate an arithmetic mean risk premium of 6.0 percent for common stocks  
9 versus long-term corporate bonds. Under the assumption of geometric mean  
10 compounding, Ibbotson's risk premium for common stocks versus corporate bonds  
11 is 4.3 percent. Ibbotson argues extensively for the arithmetic mean approach as  
12 the appropriate basis for estimating the cost of equity. Even with the more  
13 conservative geometric mean risk premium, Ibbotson's data indicate a single-A  
14 cost of equity of 11.2 percent (6.94% debt cost + 4.3% risk premium = 11.24%).

15 The Harris and Marston (H&M) study noted above also provides specific  
16 equity risk premium estimates. Using analysts' growth estimates to estimate  
17 equity returns, H&M found equity risk premiums of 6.47 percent relative to U.S.  
18 Government bonds and 5.13 percent relative to yields on corporate debt. H&M's  
19 equity risk premium relative to corporate debt indicates a current single-A cost of  
20 equity of 12.1 percent (6.94% debt cost + 5.13% risk premium = 12.07%).

1    **Q.    Please summarize the results of your cost of equity analysis.**

2    A.    The following table summarizes my results:

3	<u>Summary of Cost of Equity Estimates</u>	
4	<u>DCF Analysis</u>	<u>Indicated Cost</u>
5	Constant Growth Model	11.1%-11.2%
6	Multistage Growth Models	
7	Market Price Model	12.1%-12.1%
8	Two-Stage Growth Model	10.9%-11.0%
9	Reasonable DCF Range	<u>11.0%-12.0%</u>
10	<hr/>	
11	<u>Risk Premium Analysis</u>	
12	Utility Debt + Risk Premium	
13	Risk Premium Analysis (6.94% + 4.12%)	11.1%
14	Ibbotson Risk Premium Analysis	
15	Risk Premium (6.94% + 4.3%)	11.2%
16	Harris-Marston Risk Premium	
17	Risk Premium (6.94% + 5.13%)	12.1%
18	<hr/>	
19	Fair Cost of Equity Capital	<u>11.5%</u>
20	<hr/>	

21   **Q.    How should these results be interpreted to estimate the fair cost of equity for**  
22   **PacifiCorp?**

23   A.    From my review of the DCF and risk premium results, I estimate the reasonable  
24   cost of equity range for the comparable group to be 11.0 to 12.0 percent, with a  
25   midpoint recommendation of 11.5 percent.

26   **Q.    Does this conclude your direct testimony?**

27   A.    Yes.



PacifiCorp  
Exhibit UP&L \_\_\_\_ (SCH-1)  
Docket No. 03-2035-02  
Witness: Samuel C. Hadaway

BEFORE THE PUBLIC SERVICE COMMISSION  
OF THE STATE OF UTAH

PACIFICORP

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Exhibit Accompanying Direct Testimony of Samuel C. Hadaway  
Qualifications

May 2003

**SAMUEL C. HADAWAY**

**FINANCO, Inc.  
Financial Analysis Consultants**

**3520 Executive Center Drive, Suite 124  
Austin, Texas 78731  
(512) 346-9317**

**SUMMARY OF QUALIFICATIONS**

- Principal, Financial Analysis Consultants (FINANCO, Inc.).
- Ph.D. in Finance and Econometrics.
- Extensive expert witness testimony in court and before regulatory agencies.
- Management of professional research staff in academic and regulatory organizations.
- Professional presentations before executive development groups, the National Rate of Return Analysts' Forum, and the New York Society of Security Analysts.
- Financial Management Association, Vice President for Practitioner Services.

**EDUCATION**

**The University of Texas at Austin  
Ph.D., Finance and Econometrics  
January 1975**

*Dissertation: An Evaluation of the  
Original and Recent Variants of the  
Capital Asset Pricing Model.*

**The University of Texas at Austin  
MBA, Finance  
June 1973**

*Thesis: The Pricing of Risk on the  
New York Stock Exchange.*

**Southern Methodist University  
BA, Economics  
June 1969**

Honors program. Departmental  
distinction.

**OTHER EXPERIENCE**

**The University of Texas at Austin  
Adjunct Associate Professor  
of Finance**

MBA Corporate Financial Management.  
Undergraduate Investments.

**Southwest Texas State University  
Associate Professor of Finance  
September 1983-August 1984**

Graduate and undergraduate courses  
in financial management, managerial  
economics, and investment analysis.

**Public Utility Commission of Texas  
Chief Economist and Director of  
Economic Research Division  
August 1980-August 1983**

Lead financial witness. Supervised  
Commission staff in research and  
testimony on rate of return, financial  
condition, and economic analysis.

**Assistant Professor of Finance  
Texas Tech University  
July 1978-July 1980  
University of Alabama  
January 1975-June 1978**

Member of graduate faculty. Conducted  
Ph.D. seminars and directed doctoral  
dissertations in capital market theory.  
Served as consultant to industry,  
church and governmental organizations.

**FINANCIAL AND ECONOMIC TESTIMONY IN REGULATORY  
PROCEEDINGS (Client in parenthesis)**

**Cost of Money Testimony:**

- Public Utility Commission of Oregon, Case. UE-\_\_\_\_, March 2003, (PacifiCorp)
- Wyoming Public Service Commission, Docket No. 20000-ER-00-162, May 6 and December 18, 2002, (PacifiCorp).
- Public Utility Commission of Oregon, UG-152, November 29, 2002, (Northwest Natural)
- Massachusetts Department of Telecommunications and Energy, D.T.E. 02-24/24, May 17, 2002, (Fitchburg Gas and Electric Light Company).
- New Hampshire Public Utilities Commission, Docket No. DE 01-247, January 25, 2002, (Unitil Corporation).
- Washington Utilities and Transportation Commission, Docket UE-011569,70,UG-011571, November 26, 2001 (Puget Sound Energy, Inc.).
- California Public Utilities Commission, Docket No. 01-03-026, September 13, 2001, (PacifiCorp).
- New Mexico Public Regulation Commission, Docket No. 3643, July 3, 2001, (Texas-New Mexico Power Company).
- Texas Public Utility Commission, Docket No. 22652, June 15, 2001, (TXU Electric)
- Texas Natural Resources Conservation Commission, Docket No. 2001-1074/5-URC, May 25, 2001, (AquaSource Utility, Inc.).
- Massachusetts Department of Telecommunications and Energy, Docket No. 99-118, May 2, 2001, (Fitchburg Gas and Electric Light Company).
- Public Service Commission of Utah, Docket No. 01-035-01, January 12, 2001, (PacifiCorp)
- Federal Energy Regulatory Commission, Docket No. ER-01-651, January 2001, (Southwestern Electric Power Company).
- Wyoming Public Service Commission, Docket No. 20000-ER-00-162, December 2000, (PacifiCorp).
- Public Utility Commission of Oregon, Case. UE-116, November 2000, (PacifiCorp)
- Public Utility Commission of Texas, Docket No. 22344, September 2000, (AEP Texas Companies, Entergy Gulf States, Inc., Reliant Energy HL&P, Texas-New Mexico Power Company, TXU Electric Company)
- Public Utility Commission of Oregon, Case UE-111, August 2000, (PacifiCorp)
- Texas Public Utility Commission, Docket Nos. 22352,3,4, March 31, 2000 (Central Power and Light Co., Southwestern Electric Power Co., West Texas Utilities Co.).
- Texas Public Utility Commission, Docket No. 22355, March 31, 2000 (Reliant Energy, Inc.).
- Texas Public Utility Commission, Docket No. 22349, March 31, 2000 (Texas-New Mexico Power Co.).
- Texas Public Utility Commission, Docket No. 22350, March 31, 2000 (TXU Electric).
- Washington Utilities and Transportation Commission, Docket UE-991831, November 1999 (PacifiCorp).
- Public Service Commission of Utah, Docket No. 99-035-10, September 20, 1999 (PacifiCorp)
- Louisiana Public Service Commission Docket No. U-23029, August 1999 (Southwestern Electric Power Company)
- Wyoming Public Service Commission, Docket No. 2000-ER-99-145, July 1999, January 2000 (PacifiCorp, dba Pacific Power and Light Company).
- Texas PUC Docket No. 20150, March 1999 (Entergy Gulf States, Inc.)
- Federal Energy Regulatory Commission Docket No. ER-98-3177-00, May and December 1998 (Southwestern Electric Power Company).
- Public Service Commission of Utah, Docket No. 97-035-01, June 1998 (PacifiCorp, dba Utah Power and Light Company).

- Massachusetts Department of Telecommunications and Energy, Docket No. DTE 98-51, May 1998, (Fitchburg Gas and Electric Light Company, a subsidiary of Unitil Corp.)
- Texas PUC, Docket No. 18490, March 1998, (Texas Utilities Electric Company)
- Texas PUC Docket No. 17751, March 1998 and July 1997 (Texas-New Mexico Power Company).
- Federal Energy Regulatory Commission Docket No. RP-97, February 1998 and May 1997 (Koch Gateway Pipeline Company).
- Federal Energy Regulatory Commission Docket No. ER-97-4468-000, December 1997 (Puget Sound Power & Light).
- Oklahoma Corporation Commission, Cause No. PUD 960000214, August 1997 (Public Service Company of Oklahoma).
- Oregon Public Utility Commission Docket No. UE-94, April 1996, (PacifiCorp).
- Texas PUC Docket No. 15643, May and September 1996, (Central Power and Light and West Texas Utilities Company).
- Federal Energy Regulatory Commission Docket No. ER-96, April 1996 (Puget Sound Power & Light).
- Federal Energy Regulatory Commission Docket No. ER96, February 1996, (Central and South West Corporation).
- Washington Utilities & Transportation Commission Docket No. UE-951270, November 1995 (Puget Sound Power & Light).
- Texas PUC Docket No. 14965, November 1995, (Central Power and Light).
- Texas PUC Docket No. 13369, February 1995 (West Texas Utilities).
- Texas PUC Docket No. 12065, July and December 1994, (Houston Lighting & Power).
- Texas PUC, Docket No. 12820, July and November 1994, (Central Power and Light).
- Texas PUC Docket No. 12900, March 1994, and New Mexico PUC Case No. 2531, August 1993, (TNP Enterprises).
- Texas PUC, Docket No. 12815, March 1994, (Pedernales Electric Cooperative).
- Florida Public Service Commission, Docket No. 930987-EI, December 1993, (TECO Energy).
- Iowa Department of Commerce, Docket No. RPU-93-9, December 1993, (US West Communications).
- Texas PUC, Docket 11735, May and September 1993, (Texas Utilities Electric Company)
- Oklahoma Corporation Commission, Cause No. PUD 001342, October 1992 (Public Service Company of Oklahoma).
- Texas PUC Dkt. No. 9983, November 1991, (Southwest Texas Telephone Company).
- Texas PUC Dkt. No. 9850, November 1990, Houston Lighting & Power Company).
- Texas PUC Dkt. Nos. 8480/8482, January 1989; City of Austin Dkt. No. 1, August 1988 and July 1987, (City of Austin Electric Department).
- Missouri Public Service Commission Case No. ER-90-101, July 1990 (UtiliCorp United).
- Texas PUC Dkt. No. 9945, December 1990; Texas PUC Dkt. No. 9165, November 1989, (El Paso Electric Company).
- Texas PUC Dkt. No. 9427, July 1990, (Lower Colorado River Authority Association of Wholesale Customers).
- Oregon Public Utility Commission, March 1990, (Pacific Power & Light Company).
- Utah Public Service Commission, November 1989, (Utah Power & Light Company).
- Texas PUC Dkt. No. 5610, September 1988, (GTE Southwest).
- Iowa State Utilities Board, September 1988, (Northwestern Bell Telephone Company).
- Texas Water Commission, Dkt. Nos. RC-022 and RC-023, November 1986, (City of Houston Water Department).
- Pennsylvania PUC Dkt. Nos. R-842770 and R-842771, May 1985, (Bethlehem Steel).



### **Capital Structure Testimony:**

- Federal Energy Regulatory Commission Docket No. RP-97, May 1997 (Koch Gateway Pipeline Company).
- Illinois Commerce Commission Dkt. No. 93-0252 Remand, July 1996, (Sprint).
- California PUC (Application No. 92-05-004) April 1993 and May 1993, (Pacific Telesis).
- Montana PSC, Dkt. No. 90.12.86, November 1991, (US West Communications).
- Massachusetts PUC Dkt. No. 86-33, June 1987, (New England Telephone Company).
- Maine PUC Dkt. No. 85-159, February 1987, (New England Telephone Company).
- New Hampshire PUC Dkt. No. 85-181, September 1986, (New England Telephone Company).
- Maine PUC Dkt. No. 83-213, March 1984, (New England Telephone Company).

### **Regulatory Policy and Other Regulatory Issues:**

- New Hampshire PUC Docket No. DE 03-086, May 2003, (Unitil Corporation).
- Texas Public Utility Commission, Docket No. 26194, May 2003 (El Paso Electric Company)
- Texas PUC Docket No. 22622, June 15, 2001 (TXU Electric)
- Texas PUC Docket No. 20125, November 1999 (Entergy Gulf States, Inc.)
- Texas PUC Docket No. 21112, July 1999 and New Mexico Public Regulation Commission Case No. 3103, July 1999 (Texas-New Mexico Power Company)
- Texas PUC Docket No. 20292, May 1999 (Central Power and Light Co.)
- Texas PUC Docket No. 20150, November 1998 (Entergy Gulf States, Inc.)
- New Mexico PUC Case No. 2769, May 1997, (Texas-New Mexico Power Company).
- Texas PUC Dkt. No. 15296, September 1996, (City of College Station, Texas).
- Texas PUC Dkt. No. 14965 Competitive Issues Phase, August 1996 (Central Power and Light Company).
- Texas PUC Dkt. No. 12456, May 1994, (Texas Utilities Electric Company).
- Texas PUC, Dkt. No. 12700/12701 and Federal Energy Regulatory Commission, Docket No. EC94-000, January 1994, (El Paso Electric Company).
- Florida Public Service Commission Generic Purchased Power Proceedings, October 1993 (TECO Energy).
- Texas PUC, Docket No. 11248, December 1992 (Barbara Faskins).
- Texas PUC Dkt. No. 10894, January and June 1992, (Gulf States Utilities Company).
- State Corporation Commission of Kansas, Dkt. No. 175,456-U, August 1991, (UtiliCorp United).
- Texas PUC Dkt. No. 9561, May 1990; Texas PUC Dkt. Nos. 6668/8646, July 1989 and February 1990, (Central Power and Light Company).
- Texas PUC Dkt. No. 9300, April 1990 and June 1990, (Texas Utilities Electric Company).
- Texas PUC Dkt. No. 10200, August 1991, (Texas-New Mexico Power Company).
- Texas PUC Dkt. No. 7289, May 1987, (West Texas Utilities Company).
- Texas PUC Dkt. No. 7195, January 1987, (North Star Steel Texas).
- New Mexico PSC Case No. 1916, April 1986, (Public Service Company of New Mexico).
- Texas PUC Dkt. No. 6525, March 1986, (North Star Steel Texas).
- Texas PUC Dkt. No. 6375, November 1985, (Valley Industrial Council).
- Texas PUC Dkt. No. 6220, April 1985, (North Star Steel Texas).
- Texas PUC Dkt. No. 5940, March 1985, (West Texas Municipal Power Agency).
- Texas PUC Dkt. No. 5820, October 1984, (North Star Steel Texas).
- Texas PUC Dkt. No. 5779, September 1984, (Texas Industrial Energy Consumers).
- Texas PUC Dkt. No. 5560, April 1984, (North Star Steel Texas).
- Arizona PSC Dkt. No. U-1345-83-155, January 1984 and May 1984 (Arizona Public Service Company Shareholders Association).

### **Insurance Rate Testimony:**

- Texas Department of Insurance, Docket No. 2394, November 1999, (Texas Title Insurance Agents).
- Senate Interim Committee on Title Insurance of the Texas Legislature, February 6, 1998
- Texas Department of Insurance, Docket No. 2279, October 1997, (Texas Title Insurance Agents).
- Texas Department of Insurance, January 1996, (Independent Metropolitan Title Insurance Agents of Texas).
- Texas Insurance Board, January 1992, (Texas Land Title Association).
- Texas Insurance Board, December 1990, (Texas Land Title Association).
- Texas Insurance Board, November 1989, (Texas Land Title Association).
- Texas Insurance Board, December 1987, (Texas Land Title Association).

### **Testimony On Behalf Of Texas PUC Staff:**

- Texland Electric Cooperative, Dkt. No. 3896, February 1983
- El Paso Electric Company, Dkt. No. 4620, September 1982.
- Southwestern Bell Telephone Company, Dkt. No. 4545, August 1982.
- Central Power and Light Company, Dkt. No. 4400, May 1982.
- Texas-New Mexico Power Company, Dkt. 4240, March 1982.
- Texas Power and Light Company, Dkt. No. 3780, May 1981.
- General Telephone Company of the Southwest, Dkt. No. 3690, April 1981.
- Mid-South Electric Cooperative, Dkt. No. 3656, March 1981.
- West Texas Utilities Company, Dkt. No. 3473, December 1980.
- Houston Lighting & Power Company, Dkt. No. 3320, September 1980.

### **ECONOMIC ANALYSIS AND TESTIMONY**

#### **Antitrust Litigation:**

- Marginal Cost Analysis of Concrete Production/Predatory Pricing (Stiles)
- Analysis of Lost Business Opportunity due to denial of Waste Disposal Site Permit (Browning-Ferris Industries, Inc.).
- Analysis of Electric Power Transmission Costs in Purchased Power Dispute (City of College Station, Texas).

#### **Contract Litigation:**

- Analysis of Cogeneration Contract/Economic Viability Issues(Texas-New Mexico Power Company)
- Definition of Electric Sales/Franchise Fee Contract Dispute (Reliant Energy HL&P)
- Analysis of Purchased Power Agreement/Breach of Contract (Texas-New Mexico Power Company)
- Regulatory Commission Provisions in Franchise Fee Ordinance Dispute (Central Power & Light Company)
- Analysis of Economic Damages resulting from attempted Acquisition of Highway Construction Company (Dillingham Construction Corporation).
- Analysis of Economic Damages due to Contract Interference in Acquisition of Electric Utility Cooperative (PacifiCorp).
- Analysis of Economic Damages due to Patent Infringement of Boiler Cleaning Process (Dowell-Schlumberger/The Dow Chemical Company).

### **Lender Liability/Securities Litigation:**

- ERISA Valuation of Retail Drug Store Chain (Sommers Drug Stores Company).
- Analysis of Lost Business Opportunities in Failed Businesses where Lenders Refused to Extend or Foreclosed Loans (FirstCity Bank Texas, McAllen State Bank, General Electric Credit Corporation).
- Usury and Punitive Damages Analysis based on Property Valuation in Failed Real Estate Venture (Tomen America, Inc.).

### **Personal Injury/Wrongful Death/Lost Earnings Capacity Litigation:**

- Analysis of Lost Earnings Capacity and Punitive Damages due to Industrial Accident (Worsham, Forsythe and Wooldridge).
- Analysis of Lost Earnings Capacity due to Improper Termination (Lloyd Gosselink, Ryan & Fowler).
- Present Value Analysis of Lost Earnings and Future Medical Costs due to Medical Malpractice (Sierra Medical Center).

### **Product Warranty/Liability Litigation:**

- Analysis of Lost Profits due to Equipment Failure in Cogeneration Facility (WF Energy/Travelers Insurance Company).
- Analysis of Economic Damages due to Grain Elevator Explosion (Degesch Chemical Company).
- Analysis of Economic Damages due to failure of Plastic Pipe Water Lines (Western Plastics, Inc.)
- Analysis of Rail Car Repair and Maintenance Costs in Product Warranty Dispute (Youngstown Steel Door Company).

### **Property Tax Litigation:**

- Evaluation of Electric Utility Distribution System (Jasper-Newton Electric Cooperative).
- Evaluations of Electric Utility Generating Plants (West Texas Utilities Company).

### **Valuations of Closely Held Business in Domestic Affairs Proceedings and for Federal Estate Tax Planning.**

### **PROFESSIONAL PRESENTATIONS**

"Fundamentals of Financial Management and Reporting for Non-Financial Managers," Austin Energy, July 2000.

"Fundamentals of Finance and Accounting," the IC<sup>2</sup> Institute, University of Texas at Austin, December 1996 and 1997.

"Fundamentals of Financial Analysis and Project Evaluation," Central and South West Companies, April, May, and June 1997.

"Fundamentals of Financial Management and Valuation," West Texas Utilities Company, November 1995.

"Financial Modeling: Testing the Reasonableness of Regulatory Results," University of Texas Center for Legal and Regulatory Studies Conference, June 1991.

"Estimating the Cost of Equity Capital," University of Texas at Austin Utilities Conference, June 1989, June 1990.

"Regulation: The Bottom Line," Texas Society of Certified Public Accountants, Annual Utilities Conference, Austin, Texas, April 1990.

"Alternative Treatments of Large Plant Additions -- Modeling the Alternatives," University of Texas at Dallas Public Utilities Conference, July 1989.

"Industrial Customer Electrical Requirements," Edison Electric Institute Financial Conference, Scottsdale, Arizona, October 1988.

"Acquisitions and Consolidations in the Electric Power Industry," Conference on Emerging Issues of Competition in the Electric Utility Industry, University of Texas at Austin, May 1988.

"The General Fund Transfer - Is It A Tax? Is It A Dividend Payout? Is It Fair?" The Texas Public Power Association Annual Meeting, Austin, May 1984.

"Avoiding 'Rate Shock' - Preoperational Phase-In Through CWIP in Rate Base," Edison Electric Institute, Finance Committee Annual Meeting, May 1983.

"A Cost-Benefit Analysis of Alternative Bond Ratings Among Electric Utility Companies in Texas," (with B.L. Heidebrecht and J.L. Nash), Texas Senate Subcommittee on Consumer Affairs, December 1982.

"Texas PUC Rate of Return and Construction Work in Progress Methods," New York Society of Security Analysts, New York, August 1982.

"In Support of Debt Service Requirements as a Guide to Setting Rates of Return for Subsidiaries," Financial Forum, National Society of Rate of Return Analysts, Washington, D.C., May 1982.

## **PUBLICATIONS**

"Institutional Constraints on Public Fund Performance," (with B.L. Hadaway) *Journal of Portfolio Management*, Winter 1989.

"Implications of Savings and Loan Conversions in a Deregulated World," (with B.L. Hadaway) *Journal of Bank Research*, Spring 1984.

"Regulatory Treatment of Construction Work in Progress," abstract, (with B.L. Heidebrecht and J. L. Nash), *Rate & Regulation Review*, Edison Electric Institute, December 20, 1982.

"Financial Integrity and Market-to-Book Ratios in an Efficient Market," (with W. L. Beedles), *Gas Pricing & Ratemaking*, December 7, 1982.

"An Analysis of the Performance Characteristics of Converted Savings and Loan Associations," (with B.L. Hadaway) *Journal of Financial Research*, Fall 1981.

"Inflation Protection from Multi-Asset Sector Investments: A Long-Run Examination of Correlation Relationships with Inflation Rates," (with B.L. Hadaway), *Review of Business and Economic Research*, Spring 1981.

"Converting to a Stock Company-Association Characteristics Before and After Conversion," (with B.L. Hadaway), *Federal Home Loan Bank Board Journal*, October 1980.

"A Large-Sample Comparative Test for Seasonality in Individual Common Stocks," (with D.P. Rochester), *Journal of Economics and Business*, Fall 1980.

"Diversification Possibilities in Agricultural Land Investments," *Appraisal Journal*, October 1978.

"Further Evidence on Seasonality in Common Stocks," (with D.P. Rochester), *Journal of Financial and Quantitative Analysis*, March 1978.



PacifiCorp  
Exhibit UP&L \_\_\_\_ (SCH-2)  
Docket No. 03-2035-02  
Witness: Samuel C. Hadaway

BEFORE THE PUBLIC SERVICE COMMISSION  
OF THE STATE OF UTAH

PACIFICORP

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Exhibit Accompanying Direct Testimony of Samuel C. Hadaway  
Historical Capital Market Costs

May 2003

**PacifiCorp Utah**  
**Historical Capital Market Costs**

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
<b>Prime Rate</b>	6.0%	7.1%	8.8%	8.3%	8.4%	8.4%	8.0%	9.2%	6.9%	4.7%
<b>Consumer Price Index</b>	3.0%	2.6%	2.8%	2.9%	2.3%	1.6%	2.2%	3.4%	2.8%	1.5%
<b>Long-Term Treasuries</b>	6.6%	7.4%	6.9%	6.7%	6.6%	5.6%	5.9%	5.9%	5.5%	5.4%
<b>Moody's Avg Utility Debt</b>	7.6%	8.3%	7.9%	7.7%	7.6%	7.0%	7.6%	8.1%	7.7%	7.5%
<b>Moody's Baa Utility Debt</b>	7.9%	8.6%	8.3%	8.2%	8.0%	7.3%	7.9%	8.4%	8.0%	8.0%

**SOURCES:**

Prime Interest Rate - Federal Reserve Bank of St. Louis website  
Consumer Price Index - Federal Reserve Bank of St. Louis website  
Long-Term Treasuries - Federal Reserve Bank of St. Louis website  
Moody's Average Utility Debt - Moody's (Mergent) Bond Record  
Moody's Baa Utility Debt - Moody's (Mergent) Bond Record





PacifiCorp  
Exhibit UP&L \_\_\_\_\_(SCH-3)  
Docket No. 03-2035-02  
Witness: Samuel C. Hadaway

BEFORE THE PUBLIC SERVICE COMMISSION  
OF THE STATE OF UTAH

PACIFICORP

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Exhibit Accompanying Direct Testimony of Samuel C. Hadaway  
3-Month Average Utility Bond Yields

May 2003

## PacifiCorp Utah

### Three-Month Average Moody's Utility Bond Yields

<u>MONTH</u>	<u>MOODY'S SINGLE-A UTILITY BOND YIELD</u>	<u>MOODY'S AVERAGE UTILITY BOND YIELD</u>
Jan-03	7.07%	7.16%
Feb-03	6.93%	6.92%
Mar-03	6.83%	6.84%
AVERAGE	6.94%	6.97%

Source: Mergent Bond Record



PacifiCorp  
Exhibit UP&L \_\_\_\_ (SCH-4)  
Docket No. 03-2035-02  
Witness: Samuel C. Hadaway

BEFORE THE PUBLIC SERVICE COMMISSION  
OF THE STATE OF UTAH

PACIFICORP

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Exhibit Accompanying Direct Testimony of Samuel C. Hadaway  
Stock Price Comparison

May 2003

## PacifiCorp Utah Stock Price Comparison

Column	(1)	(2)	(3)	(4)	(5)	(6)
	MONTHLY AVG HIGH/LOW			3-MONTH	VALUE	
	FEB 03	MAR 03	APR 03	AVERAGE	LINE	DIFF
					PRICE	
1 Ameren	38.69	39.08	40.12	39.30	\$39.20	(0.09)
2 CINERGY	31.11	32.91	34.72	32.91	\$33.96	1.05
3 Cleco Corporation	12.48	11.85	13.78	12.70	\$12.30	(0.40)
4 Con. Edison	38.37	38.67	39.08	38.70	\$38.54	(0.16)
5 DPL Inc.	13.13	12.08	13.24	12.81	\$12.66	(0.15)
6 DTE Energy Co.	41.01	40.31	39.74	40.35	\$39.18	(1.17)
7 FPL Group, Inc.	56.23	57.94	59.57	57.91	\$56.52	(1.39)
8 FirstEnergy	29.29	30.33	32.37	30.66	\$28.75	(1.91)
9 Great Plains Energy	22.43	23.17	24.98	23.52	\$23.48	(0.04)
10 Northeast Utilities	14.07	13.79	14.48	14.11	\$13.95	(0.16)
11 NSTAR	40.70	40.26	41.52	40.83	\$40.40	(0.43)
12 P.S. Enterprise Gp.	33.87	35.13	37.94	35.64	\$34.50	(1.14)
13 SCANA Corp.	29.96	29.21	30.80	29.99	\$29.75	(0.24)
14 Sempra Energy	23.77	23.71	25.96	24.48	\$23.83	(0.65)
15 Southern Co.	28.04	28.61	28.58	28.41	\$28.18	(0.23)
16 Vectren Corp.	20.90	20.68	22.35	21.31	\$21.17	(0.14)
17 Wisconsin Energy	23.79	24.20	25.72	24.57	\$24.99	0.42

(\$0.40)

### Data Sources:

Value Line prices taken from company reports dated Dec 6, 2002 (East); Oct 4, 2002 (Central); and Nov 15, 2002 (West).

Monthly average prices from Yahoo website.



PacifiCorp  
Exhibit UP&L \_\_\_\_\_(SCH-5)  
Docket No. 03-2035-02  
Witness: Samuel C. Hadaway

BEFORE THE PUBLIC SERVICE COMMISSION  
OF THE STATE OF UTAH

PACIFICORP

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Exhibit Accompanying Direct Testimony of Samuel C. Hadaway  
Discounted Cash Flow Analysis

May 2003



**PacifiCorp Utah**  
**Discounted Cash Flow Analysis**  
**Summary Of DCF Model Results**

Company	Constant Growth DCF Model	Nonconstant Growth Market Price DCF Model	Low Near-Term Growth Two-Stage Growth DCF Model
1 Ameren	9.5%	12.1%	11.8%
2 CINERGY	10.1%	12.6%	11.2%
3 Cleco Corporation	12.4%	15.3%	12.1%
4 Con. Edison	9.4%	11.6%	11.1%
5 DPL Inc.	13.4%	17.7%	12.3%
6 DTE Energy Co.	11.7%	12.2%	10.4%
7 FPL Group, Inc.	9.8%	11.4%	10.0%
8 FirstEnergy	11.3%	14.5%	10.9%
9 Great Plains Energy	11.2%	9.8%	12.0%
10 Northeast Utilities	13.0%	17.4%	10.8%
11 NSTAR	10.3%	9.1%	10.8%
12 P.S. Enterprise Gp.	11.7%	10.8%	11.5%
13 SCANA Corp.	11.2%	12.5%	10.8%
14 Sempra Energy	11.0%	6.7%	9.4%
15 Southern Co.	10.4%	10.1%	10.8%
16 Vectren Corp.	12.1%	12.2%	11.0%
17 Wisconsin Energy	10.2%	9.8%	9.4%
GROUP AVERAGE	11.1%	12.1%	11.0%
GROUP MEDIAN	11.2%	12.1%	10.9%

**PacifiCorp Utah**  
**Discounted Cash Flow Analysis**  
**Constant Growth DCF Model**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Company	Recent Price(P0)	Next Year's Div(D1)	Dividend Yield	Projected Growth Rate Analysis										ROE K=Div Yld+G (Cols 3+12)
				Year 2007 "BR" Growth Rate Calculation					B*R		20 Year			
				DPS	EPS	Retention Rate (B)	NBV	ROE (R)	Growth	Zacks	Value Line	GDP Growth	Average Growth (Cols 9-11)	
1 Ameren	39.30	2.54	6.46%	2.68	3.30	18.79%	29.60	11.15%	2.09%	3.56%	0.50%	6.00%	3.04%	9.5%
2 CINERGY	32.91	1.88	5.71%	2.00	3.05	34.43%	25.40	12.01%	4.13%	4.55%	3.00%	6.00%	4.42%	10.1%
3 Cleco Corporation	12.70	0.90	7.09%	0.90	2.00	55.00%	16.50	12.12%	6.67%	3.00%	5.50%	6.00%	5.29%	12.4%
4 Con. Edison	38.70	2.26	5.84%	2.32	3.35	30.75%	32.05	10.45%	3.21%	3.33%	1.50%	6.00%	3.51%	9.4%
5 DPL Inc.	12.81	0.94	7.34%	0.94	1.75	46.29%	9.55	18.32%	8.48%	4.60%	5.00%	6.00%	6.02%	13.4%
6 DTE Energy Co.	40.35	2.06	5.11%	2.10	4.75	55.79%	40.00	11.88%	6.63%	6.17%	7.50%	6.00%	6.57%	11.7%
7 FPL Group, Inc.	57.91	2.48	4.28%	2.72	5.70	52.28%	48.75	11.69%	6.11%	5.91%	4.00%	6.00%	5.51%	9.8%
8 FirstEnergy	30.66	1.50	4.89%	1.80	4.25	57.65%	35.25	12.06%	6.95%	5.80%	7.00%	6.00%	6.44%	11.3%
9 Great Plains Energy	23.52	1.66	7.06%	1.66	2.25	26.22%	16.00	14.06%	3.69%	3.75%	3.00%	6.00%	4.11%	11.2%
10 Northeast Utilities	14.11	0.63	4.46%	0.81	2.05	60.49%	21.60	9.49%	5.74%	4.00%	18.50%	6.00%	8.56%	13.0%
11 NSTAR	40.83	2.21	5.41%	2.33	4.00	41.75%	30.75	13.01%	5.43%	4.25%	4.00%	6.00%	4.92%	10.3%
12 P.S. Enterprise Gp.	35.64	2.16	6.06%	2.32	4.60	49.57%	32.50	14.15%	7.02%	5.56%	4.00%	6.00%	5.64%	11.7%
13 SCANA Corp.	29.99	1.46	4.87%	1.70	3.25	47.69%	26.25	12.38%	5.90%	5.25%	8.00%	6.00%	6.29%	11.2%
14 Sempra Energy	24.48	1.00	4.09%	1.00	3.10	67.74%	23.25	13.33%	9.03%	6.71%	6.00%	6.00%	6.94%	11.0%
15 Southern Co.	28.41	1.43	5.03%	1.61	2.30	30.00%	15.15	15.18%	4.55%	5.08%	6.00%	6.00%	5.41%	10.4%
16 Vectren Corp.	21.31	1.15	5.40%	1.27	2.20	42.27%	18.10	12.15%	5.14%	5.33%	10.50%	6.00%	6.74%	12.1%
17 Wisconsin Energy	24.57	0.80	3.26%	1.00	2.75	63.64%	26.00	10.58%	6.73%	7.17%	8.00%	6.00%	6.98%	10.2%
GROUP AVERAGE			5.43%						5.74%	4.94%	6.00%	6.00%	5.67%	11.1%
GROUP MEDIAN			5.40%											11.2%

Sources: Value Line Investment Survey, Electric Utility (East), Mar 7, 2003;  
Electric Utility (Central), Apr 4, 2003; Electric Utility (West) Group, Feb 14, 2003  
Zacks Investment Research website, Apr 2003  
C.A. Turner Utility Reports, Apr 2003  
Company 10-K's for fiscal year 2002

NOTE: SEE PAGE 5 OF THIS SCHEDULE FOR FURTHER EXPLANATION OF EACH COLUMN

**PacifiCorp Utah**  
**Discounted Cash Flow Analysis**  
**Nonconstant Growth**  
**Market Price DCF Model**

Company	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
	Next Year's Div	2007 Div	Annual Change to 2007	Average P/E Ratio	2007 EPS	2007 Price	Recent Price	CASH FLOWS			Year 4 Div+Price	ROE=Internal Rate of Return (Cols 21-25)
								Year 1 Div	Year 2 Div	Year 3 Div		
1 Ameren	2.54	2.68	0.05	15.0	3.30	49.50	-39.30	2.54	2.59	2.63	52.18	12.1%
2 CINERGY	1.88	2.00	0.04	14.3	3.05	43.62	-32.91	1.88	1.92	1.96	45.62	12.6%
3 Cleco Corporation	0.90	0.90	0.00	9.0	2.00	17.90	-12.70	0.90	0.90	0.90	18.80	15.3%
4 Con. Edison	2.26	2.32	0.02	14.7	3.35	49.25	-38.70	2.26	2.28	2.30	51.57	11.6%
5 DPL Inc.	0.94	0.94	0.00	11.3	1.75	19.69	-12.81	0.94	0.94	0.94	20.63	17.7%
6 DTE Energy Co.	2.06	2.10	0.01	11.4	4.75	53.91	-40.35	2.06	2.07	2.09	56.01	12.2%
7 FPL Group, Inc.	2.48	2.72	0.08	13.5	5.70	76.95	-57.91	2.48	2.56	2.64	79.67	11.4%
8 FirstEnergy	1.50	1.80	0.10	10.5	4.25	44.63	-30.66	1.50	1.60	1.70	46.43	14.5%
9 Great Plains Energy	1.66	1.66	0.00	11.8	2.25	26.55	-23.52	1.66	1.66	1.66	28.21	9.8%
10 Northeast Utilities	0.63	0.81	0.06	11.3	2.05	23.17	-14.11	0.63	0.69	0.75	23.98	17.4%
11 NSTAR	2.21	2.33	0.04	11.9	4.00	47.40	-40.83	2.21	2.25	2.29	49.73	9.1%
12 P.S. Enterprise Gp.	2.16	2.32	0.05	9.4	4.60	43.24	-35.64	2.16	2.21	2.27	45.56	10.8%
13 SCANA Corp.	1.46	1.70	0.08	12.5	3.25	40.46	-29.99	1.46	1.54	1.62	42.16	12.5%
14 Sempra Energy	1.00	1.00	0.00	8.8	3.10	27.28	-24.48	1.00	1.00	1.00	28.28	6.7%
15 Southern Co.	1.43	1.61	0.06	15.1	2.30	34.73	-28.41	1.43	1.49	1.55	36.34	10.1%
16 Vectren Corp.	1.15	1.27	0.04	12.7	2.20	27.94	-21.31	1.15	1.19	1.23	29.21	12.2%
17 Wisconsin Energy	0.80	1.00	0.07	11.5	2.75	31.63	-24.57	0.80	0.87	0.93	32.63	9.8%
GROUP AVERAGE												12.1%
GROUP MEDIAN												12.1%

Sources: Value Line Investment Survey, Electric Utility (East), Mar 7, 2003;  
Electric Utility (Central), Apr 4, 2003; Electric Utility (West) Group, Feb 14, 2003  
Zacks Investment Research website, Apr 2003  
C.A. Turner Utility Reports, Apr 2003  
Company 10-K's for fiscal year 2002

NOTE: SEE PAGE 5 OF THIS SCHEDULE FOR FURTHER EXPLANATION OF EACH COLUMN

**PacifiCorp Utah**  
**Discounted Cash Flow Analysis**  
**Low Near-Term Growth**  
**Two-Stage Growth DCF Model**

Company	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)	(35)	(36)	(37)
	Next Year's Div	2007 Div	Annual Change to 2007	CASH FLOWS							ROE=Internal Rate of Return (Yrs 0-150)
				Recent Price	Year 1 Div	Year 2 Div	Year 3 Div	Year 4 Div	Year 5 Div	Year 5-150 Div Growth	
1 Ameren	2.54	2.68	0.05	-39.30	2.54	2.59	2.63	2.68	2.84	6.00%	11.8%
2 CINERGY	1.88	2.00	0.04	-32.91	1.88	1.92	1.96	2.00	2.12	6.00%	11.2%
3 Cleco Corporation	0.90	0.90	0.00	-12.70	0.90	0.90	0.90	0.90	0.95	6.00%	12.1%
4 Con. Edison	2.26	2.32	0.02	-38.70	2.26	2.28	2.30	2.32	2.46	6.00%	11.1%
5 DPL Inc.	0.94	0.94	0.00	-12.81	0.94	0.94	0.94	0.94	1.00	6.00%	12.3%
6 DTE Energy Co.	2.06	2.10	0.01	-40.35	2.06	2.07	2.09	2.10	2.23	6.00%	10.4%
7 FPL Group, Inc.	2.48	2.72	0.08	-57.91	2.48	2.56	2.64	2.72	2.88	6.00%	10.0%
8 FirstEnergy	1.50	1.80	0.10	-30.66	1.50	1.60	1.70	1.80	1.91	6.00%	10.9%
9 Great Plains Energy	1.66	1.66	0.00	-23.52	1.66	1.66	1.66	1.66	1.76	6.00%	12.0%
10 Northeast Utilities	0.63	0.81	0.06	-14.11	0.63	0.69	0.75	0.81	0.86	6.00%	10.8%
11 NSTAR	2.21	2.33	0.04	-40.83	2.21	2.25	2.29	2.33	2.47	6.00%	10.8%
12 P.S. Enterprise Gp.	2.16	2.32	0.05	-35.64	2.16	2.21	2.27	2.32	2.46	6.00%	11.5%
13 SCANA Corp.	1.46	1.70	0.08	-29.99	1.46	1.54	1.62	1.70	1.80	6.00%	10.8%
14 Sempra Energy	1.00	1.00	0.00	-24.48	1.00	1.00	1.00	1.00	1.06	6.00%	9.4%
15 Southern Co.	1.43	1.61	0.06	-28.41	1.43	1.49	1.55	1.61	1.71	6.00%	10.8%
16 Vectren Corp.	1.15	1.27	0.04	-21.31	1.15	1.19	1.23	1.27	1.35	6.00%	11.0%
17 Wisconsin Energy	0.80	1.00	0.07	-24.57	0.80	0.87	0.93	1.00	1.06	6.00%	9.4%
GROUP AVERAGE											11.0%
GROUP MEDIAN											10.9%

Sources: Value Line Investment Survey, Electric Utility (East), Mar 7, 2003;  
Electric Utility (Central), Apr 4, 2003; Electric Utility (West) Group, Feb 14, 2003  
Zacks Investment Research website, Apr 2003  
C.A. Turner Utility Reports, Apr 2003  
Company 10-K's for fiscal year 2002

NOTE: SEE PAGE 5 OF THIS SCHEDULE FOR FURTHER EXPLANATION OF EACH COLUMN

**PacifiCorp Utah**  
**Discounted Cash Flow Analysis**  
**DCF Analysis Column Descriptions**

Column 1: 3-Month Average Price per Share	Column 20: Column 18 Multiplied by Column 19
Column 2: 2004 Dividends per Share	Column 21: See Column 1
Column 3: Column 2 Divided by Column 1	Column 22: See Column 2
Column 4: Estimated 2007 Dividends per Share	Column 23: Column 22 Plus Column 17
Column 5: Estimated 2007 Earnings per Share	Column 24: Column 23 Plus Column 17
Column 6: One Minus (Column 4 Divided by Column 5)	Column 25: Column 24 Plus Column 17 Plus Column 20
Column 7: Estimated 2007 Net Book Value per Share	Column 26: Internal Rate of Return of the Cash Flows Shown in Columns 21-25
Column 8: Column 5 Divided by Column 7	Column 27: See Column 2
Column 9: Column 6 Multiplied by Column 8	Column 28: See Column 16
Column 10: Mean "5 Year Growth Est." as Reported by Zacks Investment Research.	Column 29: (Column 28 Minus Column 27) Divided by Three
Column 11: "Est'D 00-02 To 06-08" Earnings Growth as Reported by Value Line.	Column 30: See Column 1
Column 12: Last 20 Years Average Growth in GDP	Column 31: See Column 27
Column 13: Average of Columns 9-12	Column 32: Column 31 Plus Column 29
Column 14: Column 3 Plus Column 13	Column 33: Column 32 Plus Column 29
Column 15: See Column 2	Column 34: Column 33 Plus Column 29
Column 16: See Column 4	Column 35: Column 34 Increased by the Growth Rate Shown in Column 36
Column 17: (Column 16 Minus Column 15) Divided by Three	Column 36: See Average Growth Rate shown at the Bottom of Column 12
Column 18: Average of Current and Estimated 2007 P/E ratios	Column 37: The Internal Rate of Return of the Cash Flows in Columns 30-35 along with the Dividends for the Years 6-150 Implied by the Growth Rates shown in Column 36
Column 19: See Column 5	



PacifiCorp  
Exhibit UP&L \_\_\_\_ (SCH-6)  
Docket No. 03-2035-02  
Witness: Samuel C. Hadaway

BEFORE THE PUBLIC SERVICE COMMISSION  
OF THE STATE OF UTAH

PACIFICORP

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Exhibit Accompanying Direct Testimony of Samuel C. Hadaway  
Gross Domestic Product

May 2003

## PacifiCorp Utah

### Gross Domestic Product (GDP), GDP Price Deflator, and Consumer Price Index

	1	2	3	4	5	6
YEAR	GDP (\$billion)	ANNUAL % CHANGE	GDP PRICE DEFLATOR	ANNUAL % CHANGE	CONSUMER PRICE INDEX	ANNUAL % CHANGE
1961	563.4		22.5		30.0	
1962	594.4	5.5%	22.8	1.3%	30.4	1.3%
1963	634.3	6.7%	23.2	1.4%	30.9	1.6%
1964	676.3	6.6%	23.5	1.4%	31.3	1.3%
1965	748.7	10.7%	24.0	2.0%	31.9	1.9%
1966	808.6	8.0%	24.8	3.4%	32.9	3.1%
1967	854.4	5.7%	25.6	3.2%	34.0	3.3%
1968	937.8	9.8%	26.8	4.6%	35.6	4.7%
1969	1005.3	7.2%	28.2	5.2%	37.7	5.9%
1970	1054.2	4.9%	29.6	5.0%	39.8	5.6%
1971	1153.1	9.4%	31.0	4.7%	41.1	3.3%
1972	1289.7	11.8%	32.3	4.4%	42.5	3.4%
1973	1435.3	11.3%	34.6	7.0%	46.3	8.9%
1974	1551.6	8.1%	38.2	10.5%	51.9	12.1%
1975	1710.5	10.2%	41.1	7.5%	55.6	7.1%
1976	1885.3	10.2%	43.3	5.4%	58.4	5.0%
1977	2112.4	12.0%	46.2	6.7%	62.3	6.7%
1978	2418.0	14.5%	49.6	7.4%	67.9	9.0%
1979	2663.8	10.2%	53.9	8.7%	76.9	13.3%
1980	2918.8	9.6%	59.1	9.7%	86.4	12.4%
1981	3203.1	9.7%	64.1	8.4%	94.1	8.9%
1982	3315.6	3.5%	67.5	5.2%	97.7	3.8%
1983	3688.8	11.3%	69.8	3.4%	101.4	3.8%
1984	4033.5	9.3%	72.2	3.5%	105.5	4.0%
1985	4319.3	7.1%	74.4	3.0%	109.5	3.8%
1986	4537.5	5.1%	76.0	2.2%	110.8	1.2%
1987	4891.6	7.8%	78.5	3.2%	115.6	4.3%
1988	5258.3	7.5%	81.3	3.7%	120.7	4.4%
1989	5588.0	6.3%	84.2	3.6%	126.3	4.6%
1990	5847.3	4.6%	87.7	4.2%	134.2	6.3%
1991	6080.7	4.0%	90.5	3.1%	138.2	3.0%
1992	6469.8	6.4%	92.6	2.3%	142.3	3.0%
1993	6795.5	5.0%	94.8	2.4%	146.3	2.8%
1994	7217.7	6.2%	96.7	2.1%	150.1	2.6%
1995	7529.3	4.3%	98.8	2.1%	153.9	2.5%
1996	7981.4	6.0%	100.6	1.9%	159.1	3.4%
1997	8478.6	6.2%	102.5	1.8%	161.8	1.7%
1998	8984.5	6.0%	103.7	1.1%	164.5	1.7%
1999	9516.4	5.9%	105.3	1.6%	168.9	2.7%
2000	9953.6	4.6%	107.7	2.3%	174.6	3.4%
2001	10152.9	2.0%	109.8	2.0%	177.3	1.5%
Last 10 Years Average		5.3%		2.0%		2.5%
Last 20 Years Average		6.0%		2.7%		3.2%
Last 30 Years Average		7.6%		4.3%		5.0%
Last 40 Years Average		7.5%		4.1%		4.6%

Source: U.S. Department of Commerce Bureau of Economic Analysis, <http://research.stlouisfed.org/fred>





PacifiCorp  
Exhibit UP&L \_\_\_\_\_(SCH-7)  
Docket No. 03-2035-02  
Witness: Samuel C. Hadaway

BEFORE THE PUBLIC SERVICE COMMISSION  
OF THE STATE OF UTAH

PACIFICORP

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Exhibit Accompanying Direct Testimony of Samuel C. Hadaway  
Risk Premium Analysis

May 2003

## PacifiCorp Utah

### Risk Premium Analysis

	MOODY'S AVERAGE PUBLIC UTILITY BOND YIELD (1)	AUTHORIZED ELECTRIC RETURNS (2)	INDICATED RISK PREMIUM
1980	13.15%	14.23%	1.08%
1981	15.62%	15.22%	-0.40%
1982	15.33%	15.78%	0.45%
1983	13.31%	15.36%	2.05%
1984	14.03%	15.32%	1.29%
1985	12.29%	15.20%	2.91%
1986	9.46%	13.93%	4.47%
1987	9.98%	12.99%	3.01%
1988	10.45%	12.79%	2.34%
1989	9.66%	12.97%	3.31%
1990	9.76%	12.70%	2.94%
1991	9.21%	12.55%	3.34%
1992	8.57%	12.09%	3.52%
1993	7.56%	11.41%	3.85%
1994	8.30%	11.34%	3.04%
1995	7.91%	11.55%	3.64%
1996	7.74%	11.39%	3.65%
1997	7.63%	11.40%	3.77%
1998	7.00%	11.66%	4.66%
1999	7.55%	10.77%	3.22%
2000	8.14%	11.43%	3.29%
2001	7.72%	11.08%	3.36%
2002	7.50%	11.16%	3.66%
AVERAGE	9.91%	12.80%	2.89%

#### INDICATED COST OF EQUITY

CURRENT MOODY'S AVG UTILITY BOND YIELD	6.97%
MOODY'S AVG ANNUAL YIELD DURING STUDY	9.91%
INTEREST RATE DIFFERENCE	-2.94%

INTEREST RATE CHANGE COEFFICIENT	-41.87%
ADJUSTMENT TO AVG RISK PREMIUM	1.23%

BASIC RISK PREMIUM	2.89%
INTEREST RATE ADJUSTMENT	1.23%
EQUITY RISK PREMIUM	4.12%

CURRENT MOODY'S SINGLE-A UTILITY BOND YIELD	6.94%
<b>INDICATED EQUITY RETURN</b>	<b>11.1%</b>

Sources:

(1) Moody's Investors Service

(2) Regulatory Focus, Regulatory Research Associates, Inc.

## PacifiCorp Utah Risk Premium Analysis

